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R. FRITH

FINAL REPORT

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Subject: Linguistic and Ethnic
segregation in Montreal

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MEMORANDUM

R. FRITH

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FROM
De

Oswald Hall

DATE

April 6, 1966

SUBJECT
Sujet

Re Lieberman Report

This report is based on statistical materials provided to Professor Lieberman from special tabulations about Montreal prepared for us by the Dominion Bureau of Statistics. The cost of analysing the results, and the cost of computer services, were borne in part by us and in part by a grant from the National Science Foundation. Our data were supplemented by other census runs for preceding decades. The data of his study, therefore, are of a very reliable nature.


The analytical measures are relatively simple, and are few in number. He has worked toward an economy of design aimed at giving precise generalizations concerning a small set of questions.

His conclusions are very straightforward. He finds that the segregation of the two major ethnic groups is very high. The same is true of language groups. For both sorts of monolinguals - French and English - the segregation measure is high. Although these measures are high they appear to be moving still higher - there is a detectable increase from 1951 to 1961.

The report presents two kinds of elaboration on the main findings. It tries to sort out the degree to which ethnic segregation and linguistic segregation are interrelated. And it ferrets out the facts concerning the segregation of other ethnic groups as far as their residential patterns and degrees of bilingualism are concerned.

This is a meticulous report presented with a minimum of technical phraseology.

OH:jd



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LINGUISTIC AND ETHNIC SEGREGATION IN MONTREAL*

by

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Residential segregation is of great interest in any city populated by more than one ethnic or linguistic group. Spatial isolation is not only an indicator of assimilation and social distance, but is itself a vital mechanism for linguistic maintenance and ethnic continuity.

Studies of the assimilation process in various American cities show fairly high and consistent correlations between the segregation of ethnic groups and intermarriage, ability to speak English, citizenship, occupational mobility, and other facets of assimilation.^{1/} Segregation permits ethnic and linguistic groups to minimize contact with others in activities related to residence such as neighboring, children's playmates, local services, and community institutions. Residential patterns also influence the degree speakers can maximize the use of their native tongue and avoid the need to acquire a second language. Even if bilingualism is necessary for occupational or other purposes, the range of situations in which the second tongue must be spoken can be minimized through linguistic isolation. In short, if pluralism is to remain despite the demands created by the joint participation in a single economic order, then residential segregation is an absolute necessity.

The patterns of segregation in Montreal are of greater importance than in most Canadian cities since there are few centers which approach Montreal's potential for the maintenance of both major ethnic and linguistic groups. Most Canadian cities are so overwhelmingly English or French that the numerical minority can hardly maintain themselves. At present, there is little chance that Quebec's French population or Toronto's British group will give up their native tongue. In Montreal, although French Canadians are the numerically dominant ethnic group, amounting to nearly two-thirds of the metropolitan population in 1961, the British number 380,000--about 18 per cent of the population. The

60,000 French Canadians residing in Toronto, by contrast, comprise only about three per cent of the metropolitan population. In addition, nearly 20 per cent of Montreal's residents are members of other ethnic groups. More than 20 per cent of the Italians in Canada and over 40 per cent of the Dominion's Jewish population reside in Montreal. Most of these groups strengthen the position of the English language in Montreal.

Pluralism in Montreal raises several issues which are not normally found in U.S. cities and rarely even in Canada. In American cities, there is usually one clear-cut "norm" or standard with which to compare each immigrant group's residential distribution, namely, the native whites. If information were known about later generations, then probably the norm would be Americans of British origin. There is even less of a problem in determining the linguistic standard since it is clearly English. In spite of the fact that Canada recognizes the privileged status of the English and French languages, in most cities of Canada it is clear that one or the other tongue dominates. Adoption of French by the Ukrainians of Winnipeg or of English by the handful of Poles in Trois Rivières could hardly be considered a major step towards assimilation among their neighbors. In Montreal, acquisition of either official language or location near either the British or French ethnic groups can be regarded as assimilation.

There are several major aims in this study of segregation in a community which is both multilingual and multiethnic in character. First, the current residential patterns of ethnic and linguistic groups are measured and then compared with earlier decades so that the present situation may be placed into an historical perspective. Second, since there are close relationships between ethnic origin and linguistic abilities, an effort is made to determine the role of language in

influencing ethnic segregation and, conversely, the impact of ethnic segregation on linguistic residential patterns. Of particular interest is the segregation between the monolingual French and English populations since the pressure for learning a second language will in part reflect their proximity to one another. Compared with most Canadian cities, the degree of bilingualism is very high in metropolitan Montreal; more than a third of the English mother tongue population 15 years of age and older are able to speak French and nearly 60 per cent of those with French mother tongue are bilingual. The residential patterns of these bilinguals can greatly affect the positions of their ethnic groups and their native tongues. Using special census cross-tabulations, the influence of linguistic differences within each ethnic group on the residential patterns are examined. For example, do bilingual French Canadians tend to have a residential pattern which differs greatly from monolingual French Canadians? If so, does it tend to be much closer to the spatial distribution of Montreal's British population?

DATA AND METHODS

Canadian censuses provide ethnic and official language distributions for the census tracts of metropolitan Montreal in both 1951 and 1961. Census tracts are small subdivisions of the city and suburbs, rarely containing more than 10,000 residents, which are designed to be relatively uniform in area and population.^{2/} The ethnic composition of Montreal's wards are also available for 1871, 1901, and 1941 -- with data on linguistic composition reported for the latter year.

Segregation is measured by means of the index of dissimilarity, a commonly used ecological measure of differences between the proportional distributions of groups in the spatial units of an urban area, which ranges in value from 0 (no segregation) to 100 (complete segregation).

There is no segregation between two groups in a city if their distributions by census tracts are identical. An index of 100, maximum segregation, occurs only if no tract contains members of both groups, that is, if the tract holding 100 per cent of the city's X population have no residents from group Y.^{3/} A useful way of thinking about the index of dissimilarity is that it states the percentage of one group that would have to relocate into different subareas if the two groups were to have identical percentage distributions in the city's tracts or wards.^{4/}

Since the index of dissimilarity is affected by the number of spatial units, comparisons between 1871, 1901, and 1941 of absolute values are difficult due to the changing spatial arrangements in these three years. Comparisons between 1951 and 1961 are possible if the analysis is restricted to those parts of metropolitan Montreal which were tracted in both periods and if the units are recombined so that they are spatially comparable in the two periods. Segregation measures for Montreal in 1961 have been computed in three different forms: one for the entire metropolis in 1961 (Type I); one which maximizes comparisons in segregation with as much of Montreal in 1951 as possible (Type II); and, finally, a more restricted segment of the metropolis which permits comparative standardization between decades (Type III).

Two of Greenberg's measures of linguistic diversity, H_w and A_w , have been adopted to measure respectively mutual intelligibility in an official language and mother tongue diversity.^{5/} Official language data, available in 1941, 1951, and 1961, classifies each resident of the subareas into those able to speak English only, French only, both English and French, or neither official language. H_w gives the probability that two randomly drawn residents from a given neighborhood will

share knowledge of one or both official languages. The measure ranges from 0, when no two people share a common tongue, to 1.0 which would occur if everyone could communicate with everyone else in a mutually understood official language. An extension of Greenberg's measure, H_b , determines the degree of mutual intelligibility between ethnic groups.^{6/} Using the same scale, 1.0 means that all members of one group can communicate with all members of the other group; a value of 0 means that no mutually understood language was common to the two groups. A_w and A_b are comparable measures of the mother tongue diversity within and between groups.^{7/}

Finally, Westergaard's expected cases method is employed. This is a form of standardization which allows the investigator to determine the expected association between two variables after taking into account their association with a third variable. It is particularly useful in measuring the effect that linguistic differences between ethnic groups have on the actual degree of ethnic residential segregation. Analysis of the results in terms of correlation coefficients is not fully appropriate and special procedures are employed which will be described later.

RESIDENTIAL SEGREGATION: PRESENT AND PAST

The crucial linguistic and ethnic groups of metropolitan Montreal are highly segregated from each other. The index of dissimilarity between the British and French ethnic groups is 55.4 in 1961. This means that 55 per cent of one or the other ethnic group would have to relocate themselves into different census tracts if the spatial frequency distribution of the two groups was to be identical. Likewise, segregation between the monolingual speakers of English and French is also very high -- the index is 64 in 1961.

With the exception of Italians and Ukrainians, other ethnic groups are less segregated from the British than the French (Table 1, cols. 1 and 2). Northwestern European groups -- Germans, Scandinavians, and Dutch -- are far less segregated from the British than from the French; other European groups, although highly segregated from the British, are even more isolated from the French. Data are not available on the Jewish ethnic population for 1961, however examination of their segregation indexes for 1951 indicates that Jews also tend to be highly segregated from the British and even more from the French.

(Table 1 about here)

Examination of the trends in ethnic segregation between 1951 and 1961, complicated by the changes in the tracted areas, requires re-computation of the 1961 results in order to maximize comparability between the decades (shown in cols. 3 and 4 of table 1). Declining isolation from the French and British has been the general trend in the past decade for most ethnic groups (compare cols. 3 and 5, 4 and 6). Only the Italians and Russians have increased their segregation from both groups in the past decade. Increased segregation for non-specified Europeans is at least in large part due to the exclusion of Jews from this category in 1951. Except for the Germans and Asians, the ethnic groups increased or decreased in segregation from both the French and British groups.

Of particular importance are the trends in segregation between the British and French ethnic groups. In 1871, these two groups were more isolated from each other in the nine districts of the city than were either from the remaining population. It is noteworthy that the French Canadian residents of Montreal were then slightly less segregated from others than were the British (28.3 and 30.5, respectively). The current

segregation pattern in which the British ethnic group is more segregated from the French than from the remaining groups in Montreal had developed by 1901. The somewhat greater proximity of "other" ethnics to the British rather than the French population was also established by then, although it should be kept in mind that segregation from the British remains rather high. Presently, "other" ethnic groups have an average segregation index of 44.7 from the British and 58.2 from the French.

The higher the segregation between the British and French ethnic groups, the greater must be the total segregation from these two groups of other ethnic populations in Montreal. This is due to a mathematical property of segregation indexes described elsewhere which shows that the degree of residential segregation between two groups is not independent of their spatial relationship with respect to any third group.^{8/} Consequently, the residential segregation indexes between some "other" ethnic group and the British and French ethnic populations must total to at least the segregation index between the latter two groups. Since the British and French are segregated to a fairly high degree, this means that it is impossible for any of Montreal's other ethnic components to be very close in residential distribution to both of these groups. In other words, if the Italians were to achieve an index of segregation of 10 from the French, then their minimum segregation from the British would be 45.4. High segregation between the British and French in Montreal means that no ethnic group can achieve very low segregation from both of these populations, although some can be highly isolated from both of these groups.

Of great significance is the fact that British-French segregation actually increased very slightly between 1951 and 1961 (based on Type II comparisons). Not only does this mean that the two most important

groups of Montreal show no greater tendency towards residential proximity now than ten years ago, but the persistence of such isolation will prevent other ethnic groups from reaching close proximity to both of the city's major populations.

The closer residential patterns of northwestern Europeans than other Europeans to the British spatial distribution is also found in American cities as well as in Montreal.^{9/} In fact, in many Canadian cities where the French ethnic group is not important numerically and where the French language is not widely used, French-British segregation is low and more like the segregation pattern found for these two northwest European groups in American cities. For example, the indexes of segregation between these groups in metropolitan Toronto and Calgary are, respectively, only 21 and 12.

In 1961 and in the preceding two decades, the most highly isolated official language segments of Montreal have been the monolingual speakers of English and French (Table 2). While it is hardly surprising that bilinguals are less isolated from speakers of English only or French only, it is noteworthy that even those unable to speak either official language are less segregated from these two monolingual groups (compare column 1 with columns 3 and 5). Since segregation between the monolingual English and French speaking populations is even greater than that between the British and French ethnic groups, the total degree of isolation from these two basic speech groups by bilinguals or some other linguistic component must be high because of the arithmetic relationship described earlier. Because 71 per cent of the bilinguals are French Canadians, the finding that bilinguals are far more segregated from the monolingual English than from those who speak French only is more or less to be expected. There are no

(Table 2 about here)

great changes between 1951 and 1961 in the magnitude of segregation between the linguistic segments (compare rows 2 and 3), although a drop in the segregation of those unable to speak either official language from the monolingual French is found along with a rise in their segregation from speakers of English only.

Linguistic segregation raises the degree of intelligible communication possible in the subareas of Montreal above that for the city as a whole. H_w gives the proportion of randomly paired interactions between residents in which communication through a mutually shared official language is possible. Because of data limitations, it is not possible to take into account communication in tongues other than English or French. Since H_w was .83 in the city of Montreal in 1941, we would expect the same average degree of mutual intelligibility in the 35 wards if there was no segregation. In point of fact, the average H_w of .90 in the subareas was higher than that for the city as a whole. Likewise, in 1961, H_w is .79 for the entire metropolis, but averages .88 in the census tracts. In both instances, the segregation patterns tend to raise mutual intelligibility within the neighborhoods to a level greater than that for the city as a whole. If the population was randomly distributed in 1961, the frequency of mutual intelligibility would be about 10 per cent less than it actually is. One solution to diversity, aside from bilingualism, is the differential location of the speech groups so that residential contacts tend to be concentrated among those with whom communication is already possible and the need for further bilingualism is reduced.

THE RELATION BETWEEN LINGUISTIC AND ETHNIC SEGREGATION

In view of the differences between ethnic groups in their linguistic makeup, there is good reason to expect some association between ethnic

and linguistic patterns of segregation. Knowing that the ethnic groups are segregated, then at least some degree of linguistic segregation will occur if only because the French and British ethnic groups tend to be the main carriers of the French and English mother tongues, respectively. Among the population 15 years of age and over, 96.5 per cent of the French mother tongue population were members of this single ethnic group; among the English mother tongue population, 75.9 per cent were British. The tendency to favor English over French among other ethnics is illustrated by the fact that English is their mother tongue slightly more than three times as often as French. Likewise, there are some striking differences in the degree of bilingualism among the ethnic groups (Table 3). Not only is the English mother tongue population less likely to become bilingual than those with French mother tongue, 36.1 vs. 57.8 per cent, but there is considerable difference within the mother tongue categories along ethnic lines. For example, 31 per cent of native English speakers in the British group are able to speak French whereas nearly 70 per cent of Italians with an English mother tongue are also able to speak French. It is noteworthy that within each ethnic group, the French mother tongue component is usually far more likely to become bilingual than are their English mother tongue compatriots. (Table 3). The powerful attraction of English is also demonstrated in Table 3 by looking at the linguistic behavior of those whose native tongue was some other language. Among the Germans, for example, 72.8 per cent speak only the English official language, whereas 1 per cent speak only the French official language.

(Table 3 about here)

At the very least, we can say that there is some form of joint causality operating such that ethnic origin influences linguistic

segregation and, inversely, linguistic ability influences ethnic segregation. However, from the perspective of the individual it is possible to put some order into these relationships. Ethnic origin is a status ascribed at birth -- at least in terms of the census definition used in Canada, it is beyond the capacity of anyone to alter his origin or that of his offspring. Of course, we know enough about racial and ethnic relations to recognize that most people within the broad category of "white" could change their identification without detection if they are willing to conceal enough of their background and the cultural attributes associated with their ethnic group. Linguistic knowledge is somewhat in a no-man's land between being an ascribed or an achieved status. On the one hand, there is no choice in the language first learned in childhood; it is the tongue used by parents in addressing the child. On the other hand, there is some option in the languages later acquired voluntarily. Moreover, among bilingual parents, there is a choice in the tongue they can use in speaking to their offspring. In view of the complexities in attributing a causal link, we shall take the view that language and ethnic origin are related and, therefore, determine the degree each factor can be used to explain the segregation patterns of the other.

Linguistic Segregation. Shown in row 1 of Table 4 are the indexes of segregation between each of the four official language speech groups and the remainder of the population. The monolingual English speakers and the population unable to speak either official language are the most highly segregated from others; bilinguals, as might be expected, are least segregated. Row 2 gives the indexes of dissimilarity for linguistic groups "expected" on the basis of the actual ethnic residential patterns in Montreal and the cross-tabulation between ethnic origin and official

language. These figures are based on the Westergaard expected cases method. Knowing the ethnic composition in each tract and, further, the general association between official language and ethnic origins for the metropolis, the official language distribution in each tract expected on the basis of ethnic origin was determined. The percentage of actual linguistic segregation which can be explained solely on the basis of ethnic residential patterns (row 3) is obtained by dividing row 2 by row 1. This ranges from a high of 81 per cent for monolingual English speakers to a low of 47 per cent for the segregation of bilinguals. Ethnic residential patterns and the association between origin and language fail to explain 19 per cent of English monolingual residential patterns, 32 per cent of both monolingual French and those speaking no official language, and more than half of the bilingual pattern. Although ethnic origin is a major influence, it is clear that linguistic segregation patterns are more than merely a function of ethnic segregation.

(Table 4 about here)

Comparisons are possible between 1951 and 1961 in the degree ethnic segregation explains linguistic segregation only if the analysis is restricted to a smaller segment of the metropolitan area for which the necessary cross-tabulations are available for comparable areas. Comparing rows 3 and 4 we see that the role of ethnic origin has declined very slightly for all but the bilingual population whose current residential pattern is considerably less a function of ethnic origin than it was in 1951 (58 and 71 per cent, respectively).

Since the linguistic groups do not simply follow the pattern expected on the basis of ethnic segregation in Montreal, it is of interest to learn where in Montreal they tend to concentrate and what areas are

avoided. One way of looking at this problem is to compare each tract's linguistic composition with that expected on the basis of the tract's ethnic composition. The scatter-diagram in Figure 1 compares the percentage in each tract able to speak English only with the percentage expected on the basis of ethnic composition. Although a very high correlation exists between the actual and "expected" frequency of English monolinguals, $r = .99$, note how the regression slope exceeds 1 ($b = 1.21$). The solid line in Figure 1 indicates the function which would occur if the actual and expected percentages speaking English only were equal in each tract. Inspection of the scatter-diagram shows that in areas where the ethnic composition would lead us to expect to find a small percentage of monolingual English speakers, we usually find even less. By contrast, areas where a sizable proportion of the residents are expected to be English monolinguals tend to have an even larger percentage actually speaking only the English official language. The fact that b is greater than unity means that the variance in the actual degree of monolingual English spoken in the tracts of metropolitan Montreal is explained to a smaller extent by ethnic composition than might be assumed on the basis of the coefficient of correlation. Using a procedure for decomposing the variance in such situations, about 66 per cent of the variance in the percentage speaking only English is due to the net effect of ethnic composition and 28 per cent is due to the joint effect of composition with other factors.^{10/} In short, although ethnic origin explains a large part of the distribution of English only speakers, there is a strong tendency for English monolinguals to be located away from areas where there are relatively few expected and to concentrate in areas where a particularly large number are expected to begin with.

(Figure 1 about here)

A similar result is obtained for the actual and expected percentages speaking French only in the tracts of metropolitan Montreal in 1961. Again, where a small percentage of French only speakers is expected on the basis of ethnic origin, an even smaller percentage is actually found. As before, tracts whose ethnic composition leads to the expectation that a sizable segment of the population will speak French only are areas where even larger proportions are usually monolingual French speakers (Figure 2). Although the correlation is very high, $r = .95$, again the regression slope is far greater than 1, $b = 1.41$. Decomposition discloses that the net effect of ethnic composition explains only 45 per cent of the variance in the percentages speaking French only in census tracts, while 37 per cent of the variance is due to the joint effect of composition with other factors.

(Figure 2 about here)

There is very little association between composition and the degree of bilingualism; the correlation between actual and expected per cent bilingual is only .13. After finding that the percentage speaking English tends to be greater than predicted on the basis of ethnic composition when the expectation is initially high and lower than expected when the prediction is low to begin with, then to some extent the analogous finding for the monolingual French population is not completely independent. That is, in tracts where the English only speakers exceed the number expected on the basis of composition, then some other linguistic segment must be less than expected. Likewise, if there are less monolingual English speakers than expected in some tracts, then the number of at least one other linguistic component must be greater than expected in these tracts. However, the low association between

actual and expected bilingualism in Montreal indicates that the findings need not necessarily have been what they were. Moreover, comparisons between the actual and expected percentage of residents speaking French only among those who are not monolingual English speakers, i.e., $[(\text{French only}) \div (\text{French only} + \text{bilingual} + \text{neither official language})]$, indicates that this phenomenon occurs even after English monolingual speakers are excluded. For Montreal's 35 wards in 1941, the percentage of French only speakers among non-English monolinguals exceeds expectation in wards where the prediction is high, but is less than expected when a small percentage of French only speakers is predicted on the basis of ethnic composition.

There are two interpretations, both plausible, which can be offered for the finding that the actual percentage speaking English only or French only is higher than expected in those parts of the city where the ethnic composition would lead us to expect a high proportion. This may be due to either linguistic differences within each ethnic group in the residential areas they select or it may be a result from linguistic adaptation to the area of residence. It is assumed that such high regression slopes are not due to systematic errors in the enumeration of language and ethnic origin. Also, we recognize that there are certain pressures on second language learning which are independent of the residential location, particularly the demands of the work world in Montreal and the fact that both languages are taught in the Protestant and Roman Catholic school systems.

Shown below is a simplified illustration of how these findings may result from a process of adaptation to the neighborhood speech environment, in other words, second language learning and forgetting. In Illustration 1, the actual and expected linguistic composition are equal

at t_1 ; for example, the number of monolingual English speakers, 20, is the same as the number expected on the basis of the tract's ethnic composition. Since the hypothetical area is predominantly French-speaking, some of the monolingual English speakers will learn French as a second tongue if linguistic adoption occurs. The arrows show that at a later period, t_2 , five English monolinguals have become bilingual, thus reducing the number who speak English only to 15. Likewise, because of the widespread use of French in the area and the relatively small number of monolingual English speakers, it is not unreasonable to expect that some of the bilingual speakers will forget English if their first language is French. For convenience, it is assumed that all of the British have an English mother tongue and all French Canadians are native speakers of French. The diagram shows a net loss among bilingual French mother tongues of 20 who are unable to speak English by t_2 . Not all French Canadian bilinguals are expected to forget English if only because many need this tongue for occupational purposes. Since there has been no shift in ethnic composition, the number of French only speakers now exceeds "expectation" (respectively, 120 and 100) and the number of monolingual English speakers is below "expectation" at t_2 (15 vs. 20).

(Illustration 1 about here)

Critical to this process is the fact that many Montrealers acquire at least a smattering of the second official language through school or elsewhere. Therefore, if they live in a residential area which supports this second language, they will maintain or improve their ability. By contrast, if they live in an area in which their native tongue is more than adequate for communication, then this incipient bilingualism will not be supported. This, of course, would be the case for the French

Canadians in the area under consideration. In point of fact, a decline in the degree of bilingualism is found in Montreal beginning with the middle years of life.^{11/}

There is another process based on selective location within the linguistic components of each ethnic group which could yield a similar pattern. As before, in the illustration below, the actual and expected linguistic distributions are equal at t_1 . Because French is the dominant tongue in the tract, it is reasonable to assume that some of the monolingual English residents move to a neighborhood which is compatible with their linguistic skills. As shown in the diagram, 28 of the English only speakers move out by t_2 . Since bilingual members of the English mother tongue population will not have as great an impetus to leave, only 6 English mother tongue bilinguals are shown leaving the area by t_2 . The important assumption is that the probability of net outmigration is greater for the monolingual minority than their mother tongue compatriots who are bilingual. Likewise, it is assumed that the probability of net immigration to the tract is greater for monolingual speakers of the majority tongue than their mother tongue compatriots who are bilingual. Thus 40 French only and 14 bilinguals have entered the tract at t_2 . Since the ethnic composition has changed by the end of this second period, the expected linguistic distribution is also different but the same excess of French only speakers and deficit of English only speakers over that expected is observed as long as there is selective immigration among the native French speakers and selective outmigration among the English mother tongue population.

(Illustration 2 about here)

Either approach would be adequate if the population whose mother tongue is neither English nor French is included in our approach. In

terms of the learning approach, if it is assumed that these "other" speakers learn the dominant tongue of the tracts they are located in, then this will boost the actual percentage speaking the dominant tongue over that expected for the tract. For example, if members of ethnic group X are 60 per cent English speakers and 40 per cent French speakers, then in a tract which is predominantly French the percentage learning this tongue among X will be greater than the city-wide rate and therefore raise the actual rate over that expected. However, the differential location hypothesis would fit here also; namely, members of ethnic group X might select residential areas in accordance with their linguistic abilities.

Very likely linguistic adaptation to the neighborhood and selective location within ethnic groups both occur. In order to determine the relative importance of these two forces, longitudinal panel-type data are necessary so that the linguistic abilities of the population could be traced before and after residential moves. Since such data are not available, all that can be done here is to speculate. The most reasonable interpretation is that monolinguals tend to move to areas where communication is high, rather than learn a second language in order to adapt to a different linguistic environment. Although this means we are inclined to classify the role of second-language learning due to residential factors as a minor influence, very likely many do forget what knowledge they possess of a second tongue because of little usage in their residential area coupled with an absence of occupational demands.

There are several reasons for offering this interpretation. For one, the relatively low degree of bilingualism among small children suggests that second language learning as a function of residential

contacts is not very great. Second, bilingualism develops primarily in the school-age and early adult years, showing a net decline during most of the adult period.^{12/} This can be interpreted as reflecting the primary role of schooling and occupational supports for some bilinguals rather than the influence of neighborhood contacts on the chances of becoming bilingual. Third, the dual school system of Montreal, whereby the language of instruction is French in the vast majority of Roman Catholic schools and is English in nearly all Protestant schools, tends to support residential selection along mother tongue lines for those whose native tongue is either English or French. If location near the appropriate school is to be maximized, then there will be a built-in form of selective residential location. Of course, with the segregation patterns which presently exist, new schools will be built in areas with a large concentration of potential students. In turn, this will further encourage redistribution rather than adaptation to the linguistic environment. Finally, we shall soon see that ethnic residential patterns are hardly influenced by the official language abilities of the groups once mother tongue is taken into account. This suggests that residential patterns are based on communication in the native tongue and that the ability to communicate in their residential areas by means of a second-language is not an adequate substitute for most Montrealers. For these reasons, we are inclined to place primary emphasis on selective movement and redistribution as well as second-language unlearning as the main forces leading monolingual English and monolingual French to be concentrated in some parts of the city to a greater degree than expected on the basis of ethnic composition. The reader should keep in mind that this is more of a speculation than a conclusion based on empirical examination of the two alternative interpretations.

Ethnic Segregation. Ethnic segregation patterns will be influenced by differences between these groups in their linguistic composition. Shown in row 1 of Table 5 are the indexes of dissimilarity between each ethnic group and the remaining population of metropolitan Montreal in 1961. It is interesting to note that the variation between ethnic groups in their segregation is relatively low; the highest index is for the residual "Other European" category, 59.4, and the lowest is for the German ethnic population, 37.6. The British and French are both more segregated than all but three of the remaining ten groups. The high value for "Other Europeans" is probably due to the inclusion of most Jews in this category in 1961. In 1951, when data were available separately for the Jewish ethnic group of Montreal, it is clear that this group was strikingly more segregated than other groups in the metropolis (their index was 78.6, while the next most isolated group, the Dutch, had an index of 58.3).

(Table 5 about here)

The degree of segregation which could be expected on the basis of the official language abilities of the ethnic groups is shown in row 2. In the case of Italians, an index of only 13 would be obtained if this group were to locate themselves solely on the basis of their linguistic abilities and the over-all linguistic patterns of Montreal. Since their actual index is 51.4, the percentage of Italian ethnic segregation explained by official language composition is $13.3/51.4 = 26$ per cent. Generally, a greater part of northern and western European ethnic isolation can be explained by their official language composition than is the case for other ethnic groups. This may be due in part to the fact that official language data provides no information about the other tongues which these groups may speak and which can greatly

influence the patterns of ethnic segregation. For example, more than 80 per cent of the Italian ethnic group in Montreal have an Italian mother tongue. Although the Italians rank relatively high in their degree of bilingualism in both English and French, about 25 per cent of the ethnic group speak neither official language. Since they would nearly all know Italian, it is clear that language data based only on ability to speak the official tongues of Canada are inadequate for interpreting Italian ethnic isolation.

Not only are the northwestern European groups less segregated than other ethnic populations in Montreal, but row 3 shows that a larger part of their segregation can be interpreted as simply a function of official language composition. Although linguistic factors account for more of northwestern European segregation, it should be kept in mind that at best 74 per cent of an ethnic group's isolation (the Germans) can be accounted for in terms of linguistic differences.

Overall, there has been some decline during the past decade in the residential segregation of ethnic groups in Montreal (compare rows 4 and 6 of Table 5). Excluding the "Other European" category due to lack of comparability between the decades, seven groups registered declines and four increased during the ten years. The Dutch, Scandinavian, and Ukrainian groups showed fairly sharp drops for such a short period while all of the increases were relatively small. Even more significant, in all but three cases the percentage of ethnic isolation accounted for by linguistic differences between the groups rose in the decade, for example, the degree of Polish segregation explained by official language composition increased from 53 to 58 per cent (compare rows 5 and 7). These results suggest a long run trend towards less ethnic isolation in Montreal and, moreover, a larger part being due to linguistic differences between the groups.

Of particular importance, however, are the segregation patterns of the British and French ethnic groups between 1951 and 1961. In both instances, there was a small decline in their segregation, although the degree their isolation is accounted for by linguistic composition also declined. It is difficult to project long-run trends on the basis of two points of time, particularly when they are ten years apart, but what evidence we have suggests that these two ethnic groups may well take an extremely long time in reducing their isolation.

In examining the influence of language on segregation between ethnic groups, it is important to remember that there are two linguistic dimensions which are relevant; ethnic groups may differ in their mother tongues as well as their current abilities in the official languages of Canada. Indeed, mother tongue reflects a linguistic aspect which is more akin to what is customarily meant by "ethnic origin" than does official language. Tabulations for the 35 wards of Montreal in 1941 provide an excellent opportunity to examine the influence of language on ethnic segregation since data are available on both the mother tongue and official language composition of each ward. By contrast, the mother tongue composition of tracts are not available in either 1951 or 1961.

The segregation between each of 11 specified ethnic groups was computed for 1941, generating a matrix of 55 indexes of inter-ethnic segregation. Combining the cross-tabulation between mother tongue and ethnic origin for the city of Montreal with the mother tongue residential patterns in the wards, the relationship between actual segregation between ethnic groups and the indexes expected on the basis of mother tongue composition of the groups can be determined. The effect of official language on ethnic residence was examined in similar fashion.

Ethnic mother tongue composition goes a lot further in explaining the segregation patterns between ethnic groups than do inter-ethnic differences in official language composition. The product-moment correlations between actual inter-ethnic segregation and the indexes expected on the basis of mother and official language are, respectively, .93 and .17. Not only is the association much greater, but generally the indexes of segregation expected on the basis of mother tongue are far closer to the actual segregation between ethnic groups than are the indexes expected on the basis of official language composition. The average difference between the actual segregation indexes for ethnic groups and those predicted by mother tongue is 9.2; whereas the mean difference between actual segregation and the indexes predicted on the basis of official language composition is 37.0.

Computation of the patterns of ethnic segregation expected on the basis of their official language composition is an unfair test in the sense that it ignores the fact that communication is possible between bilinguals and either French or English monolingual speakers. Since monolinguals and the bilingual population have different spatial distributions in the city, examination of inter-ethnic segregation in terms of the patterns expected on the basis of official language ignores the communication potential which may exist between members of two different ethnic groups. In other words, two ethnic groups can be highly dissimilar from one another in their official language composition, but have a high degree of potential communication. Accordingly, two additional measures were computed: H_b , which gives the probability of mutual intelligibility in one or both official languages when members of two ethnic groups are randomly paired together; and A_b , which gives the probability that randomly selected members of the two ethnic groups will share a common mother tongue.^{13/}

Again, residential segregation between ethnic groups is influenced by mother tongue similarities to a far greater degree than by potential communication in an official language. The correlation between inter-ethnic segregation (in logarithms) and A_b is $-.84$. By contrast, the correlation between segregation (also expressed in logarithms) and H_b is only $-.39$, with 16 per cent of the variance explained. The partial correlations show no association between segregation and official language after mother tongue is taken into account, partial $r = -.04$; whereas the partial correlation between segregation and mother tongue is $-.81$ after taking official language communication into account.

Much of the variation in residential segregation between ethnic groups can be accounted for in terms of their mother tongue composition whereas the independent effect of official language is nil. This suggests that the way peoples start out linguistically will greatly influence their propensities to locate near one another later, but languages acquired later in life will have little influence on ethnic segregation patterns. These findings are supported by the fact that early learning of a language is critical for most persons in determining their fluency and ability in the tongue. In terms of informal social contacts such as are likely to arise in neighborhood settings, the mother tongue similarities between ethnic groups are of considerable importance. These results tend to support the earlier contention that linguistic groups tend to avoid each other rather than be modified by proximity to others. Later language learning plays only a minor role at best in influencing ethnic segregation patterns. Thus, in a city where a sizable part of the population learns a second language, this has little bearing on ethnic residential distributions. What is crucial is the language the child first learns, not languages

learned later. There is an ecological counterpart here to the demographic fact that most French Canadian children start with the French mother tongue and most children of British origin start with the English mother tongue. Even though many later acquire a knowledge of the second official language, these findings suggest that this has little impact on their residential segregation and, further, very likely the groups continue to live apart.

LINGUISTIC DIVERSITY

In Montreal, where every ethnic group is linguistically diverse and, likewise, each linguistic group consists of several ethnic components, the potential importance of language for the disintegration of ethnic unity is enormous. If the segments of an ethnic group who acquire a second tongue tend to drift away from their ethnic compatriots who remain monolingual, then the group's basic strength can be seriously undermined -- particularly when a large number become bilingual. If ethnic assimilation occurs because of linguistic changes, then very likely greater pressure will exist on the remaining monolingual members since their group's basic position in the community will be weakened because of the numerical decline. Using special tabulations run for the Royal Commission on the census tract distributions of the various linguistic segments of each ethnic group in metropolitan Montreal in 1961, it is possible to examine directly the segregation patterns among the linguistic subgroups of the two major ethnic populations. Thus we can directly test our previous inferences about the effect of bilingualism on ethnic segregation.

The main linguistic segments of both the British and French ethnic groups consist of those who speak only their group's native tongue and those who are bilingual. While it is clear that acquisition of

the second official language influences the residential pattern, the bilinguals of each ethnic group still favor their own ethnic compatriots over the other ethnic group. For example, the segregation index between the bilingual and English only components of the British ethnic group is 19.3. While this is by no means trivial, British bilinguals are much more highly segregated from the French ethnic population. For example, their index of segregation from French Canadian bilinguals is 43.7 and from monolingual French speakers among French Canadians it is 55.6. To be sure, monolingual English speaking members of the British ethnic group are even more segregated from these components of the French Canadian population, respectively, 59.2 and 70.3. Although it is very clear that linguistic ability modifies ethnic isolation, for example, bilingual members of the British ethnic group are less isolated than are their monolingual English compatriots from the French ethnic population, the fact remains that bilingual British Canadians are much less segregated from ethnic compatriots who speak only English.

Likewise, although bilingualism affects the residential pattern of French Canadians, they are still closer to their monolingual French compatriots than they are to various British segments in Montreal. For example, French bilinguals have a segregation index of 18.7 from monolingual French compatriots, but their segregation from the British runs from 43.7 (British bilinguals) and higher. Again, French Canadians who speak only French are even more highly isolated from these components of the British group.

In short, the bilinguals of both the French and British populations are much less segregated from their ethnic compatriots with the same mother tongue than they are from the other major ethnic group. Thus, while bilingualism is related to the residential patterns among both

ethnic populations, the paramount factor influencing location is still proximity to ethnic compatriots. Accordingly, knowledge of the other ethnic group's tongue does not lead to a grand exodus of bilinguals into the camp of their ethnic rivals. This is of great importance since it indicates an ecological mechanism which allows both the British and French to maintain their mother tongue among the new generation of offspring. Although there is considerable bilingualism among both groups and therefore an "exposure to risk" that the acquired tongue may be passed on as the next generation's first language, the fact that bilinguals in each ethnic group tend to locate in areas where their monolingual compatriots are found tends to reduce this danger to the mother tongue.

Members of the British ethnic group who are monolingual French speakers and French Canadians who are able to speak only the English official language are both in rather anomolous positions since they do not share the predominant mother tongue of their ethnic compatriots, but instead are able to speak only the native language of their ethnic rivals. Whether the product of ethnic intermarriage or assimilation into the other ethnic group, these people are essentially lost to the other ethnic group. They are much closer in residence to the other ethnic group than they are to their own ethnic compatriots. For example, French Canadians who speak English only have segregation indexes of 51.8 and 63.1 respectively from French Canadian bilinguals and monolingual French speakers. By contrast, their index of segregation from the British population is only 24.8. Similar results are obtained for British Canadians who speak only French; their index from other British Canadians who are bilingual is 60.3 and from British who speak only English is 71.8. By contrast, the index of segregation between

French Canadians and the monolingual French component of the British ethnic group is 36.6.

COMMENT

If it is assumed that residential integration is an essential prerequisite to ethnic fusion and linguistic homogeneity, then the basic implication of this study is that the diversity of Montreal is destined to remain rather high in the foreseeable future. Although some decline is noted in segregation in the past decade, the maintenance of high British-French isolation on both linguistic and ethnic lines indicates not only that the main elements in Montreal will continue to go their separate ways, socially speaking, but that other linguistic and ethnic components will be forced to choose between one group or the other. Younger's observation of the two paths which other ethnic groups may take in Montreal, although made two decades ago, still apply to the current situation.^{14/}

Residential segregation and bilingualism are alternate means for adopting to a situation of linguistic diversity. Segregation helps to protect a group from dissolution since contact with others is reduced; bilingualism provides a potential mechanism for the loss of linguistic distinctiveness since the members may opt to pass on the learned language to their children rather than the mother tongue. For the British and French bilinguals, the finding that they still tend to reside much closer to monolingual ethnic compatriots than to the competing ethnic group suggests that there are ecological reasons for the failure of bilingualism thus far to undercut the linguistic maintenance of these two groups.

Ethnic and linguistic segregation tend to reinforce each other in the sense that the ethnic groups differ in their linguistic composition

and, likewise, the linguistic groups differ from one another in their ethnic makeup. However, it should be noted that ethnic segregation is not explained solely as a function of the linguistic differences between the groups. This is to be expected since patterns of ethnic segregation are found in many cities where linguistic differences have disappeared. Nevertheless, as some of the findings reported earlier indicate, ethnic segregation is no doubt greatly increased because of the linguistic differences accompanying these groups. Likewise, although differences in ethnic composition tend to explain a fair part of the linguistic segregation found in Montreal, our analysis showed rather clearly a tendency for language groups to concentrate among themselves to a greater extent than can be explained solely by ethnic factors. The fact that people speaking different tongues tend to avoid each other helps to reduce the degree of bilingualism necessary since residential areas have higher rates of mutual intelligibility among residents than would occur if there was no segregation in Montreal.

Linguistic characteristics are but one part of the complex which comprises an ethnic group, but in so far as the ethnic groups are able to maintain their distinctive languages, then this will retard assimilation between the British and French on other dimensions as well. And in so far as the groups remain highly segregated from one another, it is unlikely that any linguistic fusion between the groups will occur.

- ¹Otis Dudley Duncan and Stanley Lieberman, "Ethnic Segregation and Assimilation," American Journal of Sociology, LXIV (January, 1959), 364-74; Stanley Lieberman, "The Impact of Residential Segregation on Ethnic Assimilation," Social Forces, XL (October, 1961), 52-57.
- ²Dominion Bureau of Statistics, Census of Canada, 1961, "Population and Housing Characteristics by Census Tracts, Montreal," Bulletin CT-4 (Ottawa: Minister of Trade and Commerce, 1963), p. 3.
- ³See Otis Dudley Duncan and Beverly Duncan, "Residential Distribution and Occupational Stratification," American Journal of Sociology, LX (March, 1955), 493-495.
- ⁴A more elegant interpretation of the index of dissimilarity is possible based on the number of each group who would have to redistribute themselves.
- ⁵Joseph H. Greenberg, "The Measure of Linguistic Diversity," Language, XXXII (January-March, 1956), 109-15.
- ⁶Stanley Lieberman, "An Extension of Greenberg's Measures of Linguistic Diversity," Language, XL (October-December, 1964), 526-31.
- ⁷Ibid.
- ⁸Stanley Lieberman, Ethnic Patterns in American Cities (New York: Free Press of Glencoe, 1963), pp. 38-40.
- ⁹Ibid., ch. iii.
- ¹⁰Otis Dudley Duncan, Ray P. Cuzzort, and Beverly Duncan, Statistical Geography (Glencoe, Illinois: The Free Press, 1961), pp. 118-28; Patricia Hodge and Robert W. Hodge, "Regression Analysis of Standardized Proportions," unpublished manuscript.

- 11 Stanley Lieberman, "Bilingualism in Montreal: A Demographic Analysis," American Journal of Sociology, LXXI (July, 1965), 10-25.
- 12 For data on age at which bilingualism occurs, see Ibid.
- 13 For convenience in presentation and comparison, the A_b index was reversed from its normal computation so as to make 1.0 equal to mother tongue similarity and equal to no overlap between two groups in their mother tongue composition. It should also be noted that the "other mother tongue" category was not used in cross-multiplication, that is, it was assumed that the population speaking an "other" mother tongue in one group could not speak to the population with "other" mother tongue in another group. Undoubtedly this yielded some errors, however they are likely to be slight since most ethnic groups have very low percentages in the residual mother tongue category. Exceptions are the Dutch and Scandinavian groups. Since the mother tongues of these groups were not specified, it was assumed that speakers in these groups who were classified in the "other" mother tongue category spoke the groups' native language.
- 14 Eva R. Younge, "Population Movements and the Assimilation of Alien Groups in Canada," Canadian Journal of Economics and Political Science, X (August, 1944), 372-80.

TABLE 1
BRITISH AND FRENCH RESIDENTIAL SEGREGATION FROM OTHER ETHNIC GROUPS

Ethnic Group	Type I 1961		Type II			
	British (1)	French (2)	1961		1951	
			British (3)	French (4)	British (5)	French (6)
German	30.2	52.2	30.6	54.5	28.4	58.4
Italian	66.3	51.0	66.3	50.1	60.8	43.9
Jewish	NA	NA	NA	NA	74.0	86.2
Netherlands	28.2	59.0	28.7	60.6	31.3	71.8
Polish	47.1	54.3	46.5	54.0	50.2	57.6
Russian	55.7	70.2	54.6	70.5	51.9	68.4
Scandinavian	18.6	56.4	19.1	57.9	23.1	65.0
Ukrainian	54.3	53.5	54.3	52.7	61.5	59.0
Other Europe	55.9	66.9	55.8	67.6	36.8	51.7
Asiatic	52.8	55.4	51.9	54.4	53.9	50.3
Other and Not Stated	38.4	63.1	37.1	63.5	41.8	65.9

NA Not available

Note: Jews not specified in 1961, mainly included in "Other Europe" category.

TABLE 2
RESIDENTIAL SEGREGATION BETWEEN OFFICIAL LANGUAGE COMPONENTS OF MONTREAL

Year	English only and:			French only and:		Bilingual
	French only (1)	Bilingual (2)	Neither (3)	Bilingual (4)	Neither (5)	Neither (6)
1961, Type I	64.3	43.4	61.9	24.6	59.4	54.0
1961, Type II	66.0	44.3	61.3	24.9	57.8	53.4
1951, Type II	66.6	45.1	54.4	24.0	64.7	54.4
1941	60.6	44.2	42.5	18.2	55.9	48.4



TABLE 3

BILINGUALISM AMONG THE POPULATION WITH ENGLISH OR FRENCH MOTHER TONGUE
AND OFFICIAL LANGUAGE DISTRIBUTION AMONG THOSE WITH ANOTHER MOTHER
TONGUE, POPULATION 15 YEARS OF AGE AND OLDER, METROPLITAN MONTREAL,
1961

Ethnic Group	Per Cent Bilingual		Official Language Distribution Among those with Another Mother Tongue			
	English Mother Tongue	French Mother Tongue	English only	French only	Biling.	Neither
British	30.6	77.7	57.2	1.7	29.4	11.7
French	65.8	57.2	13.1	26.1	47.3	13.5
Other than British or French	49.1	74.8	44.3	10.8	32.0	13.0
German	31.7	76.1	72.8	1.0	23.7	2.6
Italian	68.7	79.7	10.6	27.3	36.2	25.9
Jewish	56.6	90.2	60.4	0.6	35.5	3.5
Ukrainian	54.0	88.3	53.8	5.1	37.6	3.6
All Other	42.4	69.1	57.2	4.5	28.6	9.7
All Groups	36.1	57.8	44.1	10.8	32.1	13.0

TABLE 4

RESIDENTIAL SEGREGATION BETWEEN OFFICIAL LANGUAGE SEGMENTS AND REMAINDER OF
THE POPULATION, ACTUAL AND EXPECTED

<u>Year and Type</u>	<u>Segregation from the Remainder of the Population</u>			
	<u>English only</u>	<u>French only</u>	<u>Bilinguals</u>	<u>Neither official language</u>
<u>1961, Type I</u>				
Actual Segregation Index	53.5	38.0	12.9	54.6
Expected Segregation Index	43.3	25.7	6.1	36.9
Per Cent Explained by Ethnic segregation	81	68	47	68
<u>Type III</u>				
1961, Per Cent Explained by Ethnic Segregation	80	67	58	70
1951, Per Cent Explained by Ethnic Segregation	83	72	71	71

Note: Expected linguistic segregation index based on the ethnic residential patterns in Montreal and the cross-tabulation between official language and ethnic origin.

RESIDENTIAL SEGREGATION BETWEEN ETHNIC GROUPS AND REMAINDER OF THE POPULATION, ACTUAL AND EXPECTED

Note: Expected ethnic segregation index based on the official language residential patterns in Montreal and the cross-tabulation between official language and ethnic origin.

Expected ethnic segregation index based on the official language residential patterns in Montreal and the cross-tabulation between official language and ethnic origin.

ILLUSTRATION 1

HYPOTHETICAL SHIFTS BETWEEN LINGUISTIC CLASSES

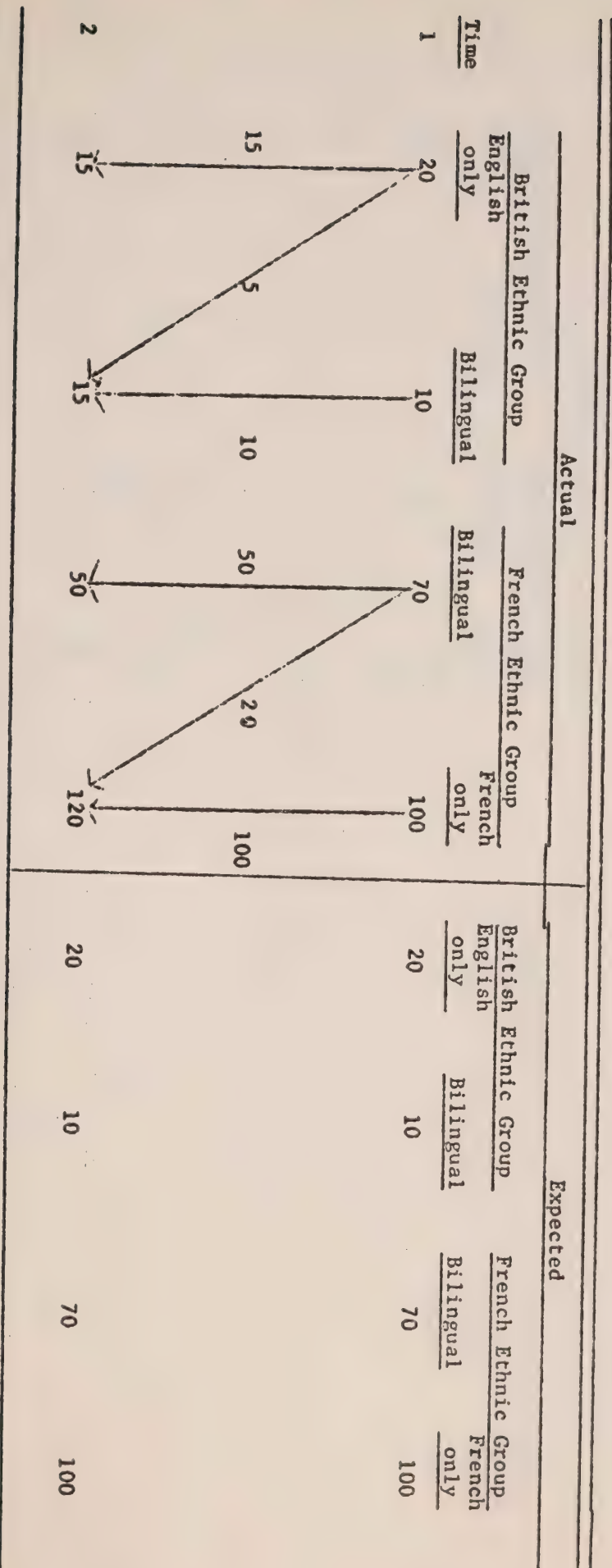
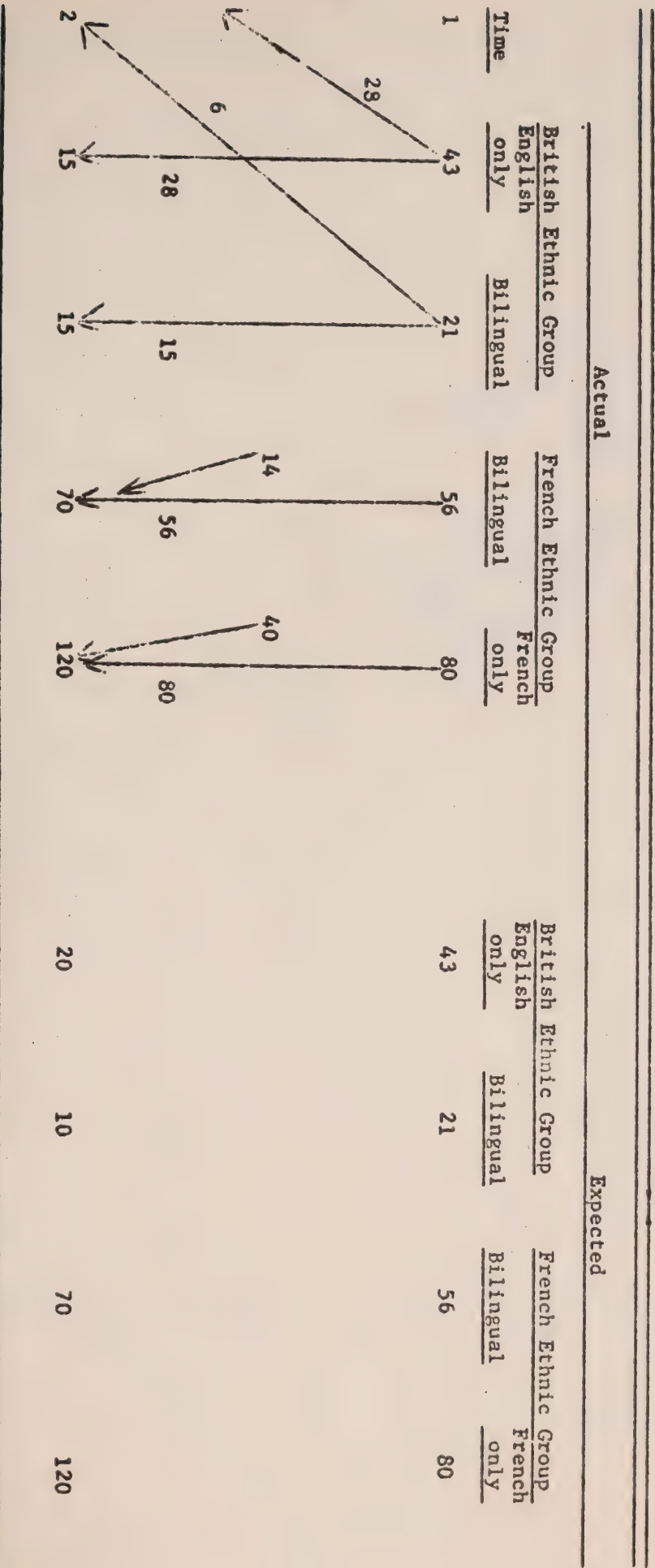


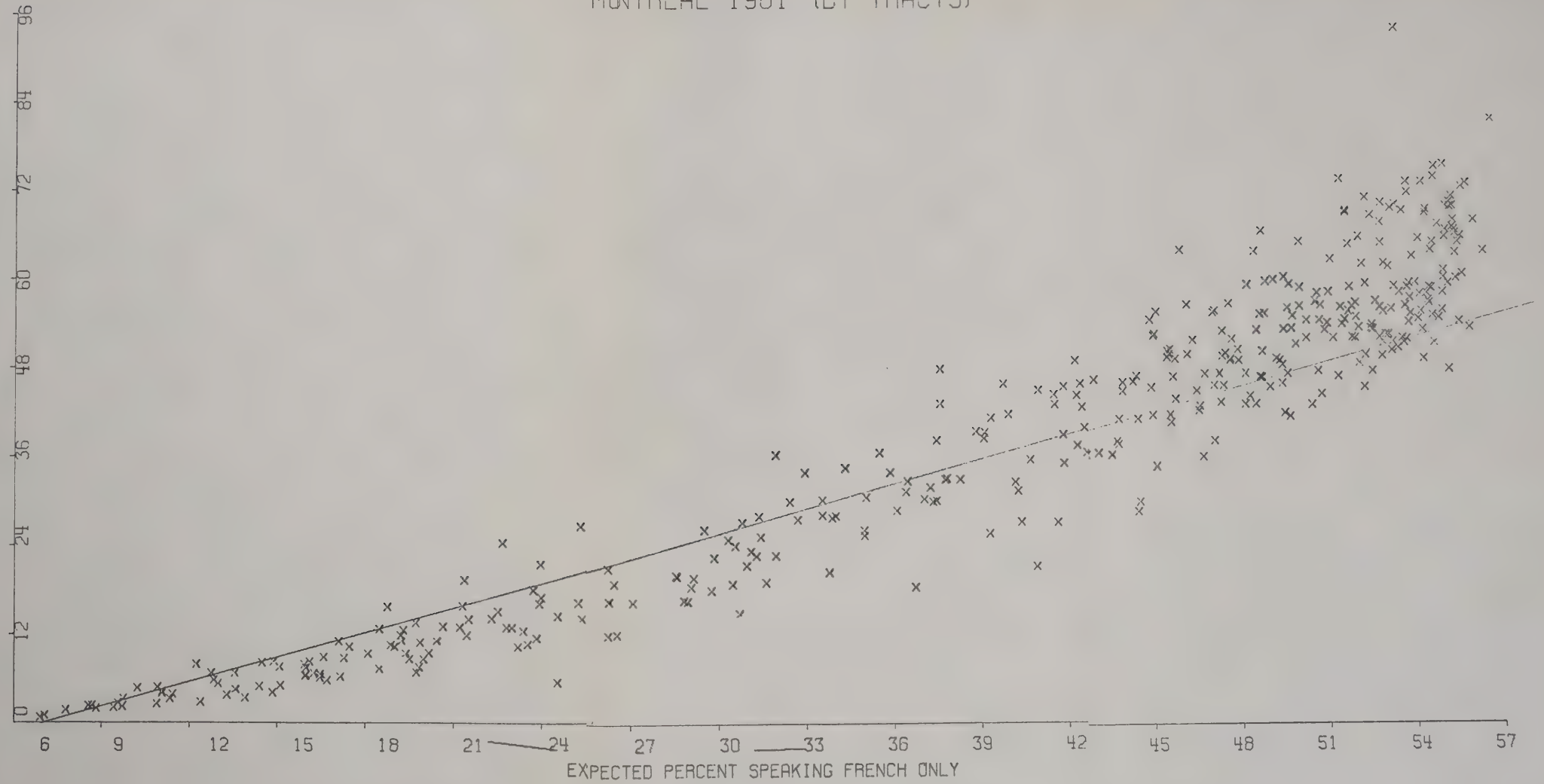
ILLUSTRATION 2

HYPOTHETICAL DIFFERENTIALS IN MIGRATION



MONTREAL 1961 (BY TRACTS)

ACTUAL PERCENT SPEAKING FRENCH ONLY



01/01/65

MONTREAL 1961 (BY TRACTS)

